# Pre-admission anti-coagulation does not improve all-cause mortality in geriatric COVID-19 patients

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## Introduction

Initial studies have shown that patients infected with SARS-CoV-2 are at high risk of venous-thromboembolic events (VTE).[1] Post-mortem studies of patients with COVID-19 disease frequently show diffuse alveolar damage, pulmonary emboli and microthrombi in the lungs.[2] Derangement of coagulation parameters such as a significantly raised D-dimer, fibrinogen and prolonged prothrombin time has also been observed and often is prognostically important with regard to mortality.[3] Rapid advances have been made in establishing treatments for COVID-19, including anticoagulation therapies. This retrospective observational study investigates whether pre-admission anticoagulation with warfarin or a direct oral anticoagulant (DOAC) improves all-cause mortality for geriatric COVID-19 patients compared to those who are not anticoagulated before admission.

## Materials and methods

A total of 309 patients aged 70 and over who were admitted to a district general hospital in south-east England between 15 March and 31 May 2020 were included. Infection with SARS-CoV-2 was confirmed with viral PCR testing during that admission. Preadmission anticoagulant therapy was ascertained by looking at the medications section of the most recent hospital discharge letter on electronic records. The outcome of patients was classified as either discharge or death.

## Results and discussion

161 male patients (52.1%) and 148 female patients (47.9%) were included, with median age for discharged patients being 83 (range 70–101) and 85 (range 70–105) being the median age of those who died.

A total of 26.2% (n=81) were prescribed oral anticoagulation prior to admission; 69 were on a DOAC and 12 on warfarin (Fig 1). Of those who were anticoagulated, 46.9% (n=38) died during admission, compared to 48.2% (n=110) among those without pre-admission anticoagulation (Fig 2). There was no statistically significant improvement in all-cause mortality for patients who were anticoagulated preadmission on univariate analysis (odds ratio (OR) 0.95; 95% confidence interval (CI) 0.56–1.57; p>0.05).

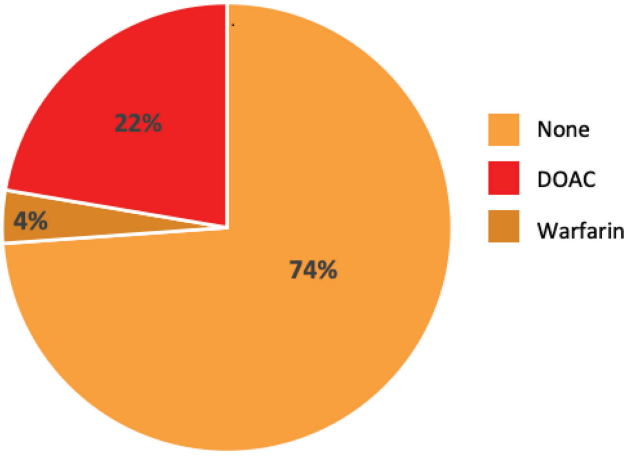


**Fig 1. Proportion of patients on pre-admission anti-coagulation vs not on anticoagulation.**

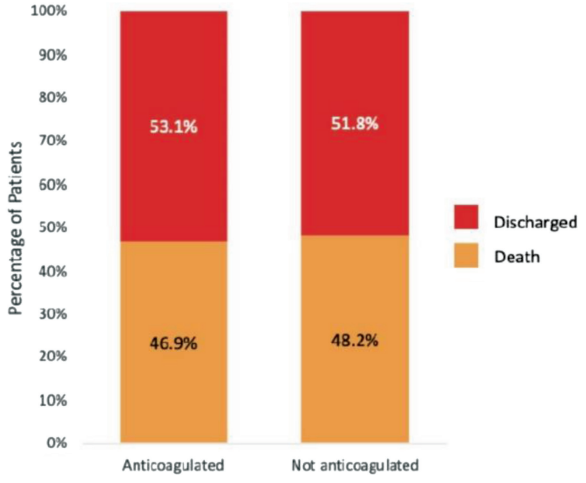


**Fig 2. Outcome for patients on pre-admission anti-coagulation vs not on anticoagulation.**

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Proportionally more male patients with COVID-19 died during admission compared to females (57% vs 43%; p=0.021). While not statistically significant, male patients with SARS-CoV-2 infection were found to have a higher mortality compared to female patients (OR 1.47; 95% CI 0.94–2.30; p=0.094).

## Limitations

Due to lack of electronic prescribing at the hospital, drug history was taken from the medications list in previous discharge letters. Some patients may have commenced anticoagulation therapy in primary care or other secondary/tertiary care institutions. Conversely, some of the patients recorded as anticoagulated may have stopped taking the medication prior to the admission studied here. We did not assess compliance, type of DOAC or dosage, which may have impacted the results.

## Conclusion

Pre-admission anticoagulation therapy does not appear to improve all-cause mortality for elderly patients admitted to hospital with COVID-19, suggesting that patients on anticoagulation therapy have the same mortality rate as those who are not taking these agents. Larger sample size, correlation of mortality with coagulation parameters and comparison with younger age groups with COVID-19 would be useful to examine to gain more understanding of how this disease affects the older generation and to potentially advance treatments. ■

## Conflicts of interest

None declared.

## References

1 Middeldorp S, Coppens M, van Haaps TF *et al.* Incidence of venous thromboembolism in hospitalized patients with COVID-19. *J Thromb Haemost* 2020;18:1995–2002.
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3 Yao Y, Cao J, Wang Q *et al.* D-dimer as a biomarker for disease severity and mortality in COVID-19 patients: a case control study. *J Intensive Care* 2020;8:49.